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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/597,025

07/07/2006

Toshihiko Ushiro

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EXAMINER

BROOKS, JERRY L.

ART UNIT

PAPER NUMBER

4126

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/597,025	<b>Applicant(s)</b> USHIRO ET AL.	
	<b>Examiner</b> JERRY BROOKS	<b>Art Unit</b> 4126	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07/07/2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/20/2008,08/09/2006</u> .                                   | 6) <input type="checkbox"/> Other: ____.                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itoh et al. (US 7,119, 957 B2) in view of Cuomo et al. (5, 225, 926).

3. With respect to claim 1, Itoh et al. (US 7,119,957 B2), hereinafter referred to as "Itoh," discloses: A polarization integrator (Fig. 12A) including a polarizing beam splitter (Fig. 12A, 1201) for splitting light from a light source into P-polarized light and S-polarized light, a first micro-lens (Fig. 12A, 442), a  $\frac{1}{2}$ -wave plate (Fig. 12A, 446), and a second micro-lens (Fig. 12A, 451 and 1231), characterized in that:

4. said first micro-lens (Fig. 442) is arranged to focus onto mutually differing positions the P-polarized light and S-polarized light split by said polarizing beam splitter (see Detailed Description of Preferred Embodiments: column 23, paragraph 6);

5. said  $\frac{1}{2}$ -wave plate (Fig. 12A, 446) is arranged either in the position in which the P-polarized light or in which the S-polarized light is focused, and operates to convert either the P- polarized light or the S-polarized light into S-polarized light or P-polarized light (see Detailed Description of Preferred Embodiments: column 23, paragraph 6);

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6. said second micro-lens (Fig. 12A, 451 and 1231) operates to integrate either the S-polarized light or the P-polarized light having passed through said  $\frac{1}{2}$ -wave plate and been polarization- converted, with either the S-polarized light or P-polarized light not having passed through said  $\frac{1}{2}$ -wave plate (see Detailed Description of Preferred Embodiments: column 23, paragraph 6). Itoh does not disclose at least one of said polarizing beam splitter, said first micro-lens, said  $\frac{1}{2}$ -wave plate, and said second micro-lens is formed using a DLC film.

7. However, Cuomo et al. (5, 225, 926), hereinafter referred to as "Cuomo," discloses a polarizing beam splitter, formed using a DLC film (column 4, paragraph 4). Cuomo teaches that optical elements fabricated using a DLC film improves operating performance and lowers maintenance requirements of the devices which include them (column 1, paragraph 2). At the time of invention, it would have been obvious to a person of ordinary skill in the art to use Cuomo's polarizing beam splitter in Itoh's device to improve its performance and lower its maintenance requirements. Therefore, it would have been motivated to combine the teachings Itoh and Cuomo to obtain the invention as specified in claim 1.

8. With respect to claim 5, Itoh in view of Cuomo discloses a polarizing integrator as set for in claim 1 as discussed above and further teaches a liquid crystal projector containing it (column 1, lines 40-45).

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9. Claims 1, 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itoh et al. (US 7,119,957 B2) in view of Cuomo et al. (5, 225, 926) and further in view of Hiyama et al (US 6, 222, 598).

10. With respect to claim 2, Itoh et al. (US 7,119,957 B2) herein after referred to as "Itoh" in view of Cuomo et al. (5, 225, 926) herein after referred to as "Cuomo," discloses a polarizing integrator as set forth in claim 1 and also teaches a polarizing beam splitter formed in a DLC film as discussed above. However, Itoh in view of Cuomo does not disclose a polarizing beam splitter formed by a refractive index-modulated diffraction grating formed in a DLC film.

11. Hiyama et al (US 6, 222, 598), hereinafter referred to as "Hiyama," discloses a beam splitter (see Fig. 4, 70 and 40) formed by a refractive index-modulated diffraction grating (see Column 6, last paragraph). Hiyama also teaches that using a beam splitter form by a refractive index-modulated diffraction grating achieves a high-efficiency light path conversion (Column 7, paragraph 2). It would have been obvious to one of ordinary skill in the art at the time of in invention to incorporate Hiyama's refractive index-modulated diffraction grating in Itoh's device in view of Cuomo to improve the efficiency of its light path conversion. Therefore, it would have been motivated to combine Hiyama's teaching and Itoh in view of Cuomo to the increase efficiency.

12. With respect to claim 3, Itoh in view of Cuomo and further in view of Hiyama discloses a polarizing integrator as set for in claim 1 or 2 as discussed above, Itoh further discloses a refracting lens (Fig. 15, 445) but does not disclose the refracting lens

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formed in a DCL film. Cuomo teaches that optical elements fabricated using a DLC film, improves operating performance and lowers maintenance requirements of the devices which include them (column 1, paragraph 2). At the time of invention, it would have been obvious to one of ordinary skill in the art to apply Cuomo's teaching in Itoh's device to improve its performance and lower its maintenance requirements. Therefore, it would have been motivated to combine the teachings Itoh and Cuomo to obtain the invention as specified in claim 3.

13. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itoh et al. (US 7,119,957 B2) in view of Cuomo et al. (5, 225, 926) and further in view of the Supreme Court decision *In re Harza* ( 274 F.2d 669, 124 USPQ 378).

14. With respect to claim 4, Itoh et al. (US 7,119,957 B2) herein after referred to as "Itoh" in view of Cuomo et al. (5, 225, 926) herein after referred to as discloses as "Cuomo," discloses a polarizing integrator as set for in claim one as discussed above, but does not disclose it characterized in that a plurality of groups each being of said polarizing beam splitter, said first micro-lens, said  $\frac{1}{2}$ -wave plate, and said second micro-lens are arrayed periodically within a sectional plane of the beam from said light source. However the mere duplication of parts has no patentable significance unless a new and unexpected result is produced (See Supreme Court decision *In re Harza*, 274 F.2d 669, 124 USPQ 378).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERRY BROOKS whose telephone number is (571)270-5711. The examiner can normally be reached on Monday-Thursday: 10 a.m.-5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tu Nguyen can be reached on (571)272-2424. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JERRY BROOKS/  
Examiner, Art Unit 4126

/James P. Hughes/  
Primary Examiner, Art Unit 2883